

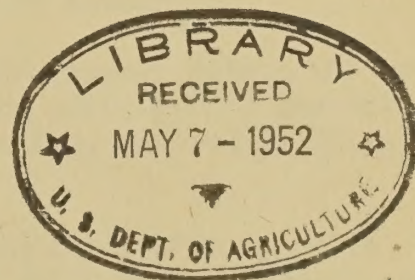
² MICHIGAN 43 CHIPPEWA ⁰

FIELD APPRAISAL ANALYSIS ¹⁷

Prepared by
Program Analyst
Office of the Administrator
² (U.S. RURAL ELECTRIFICATION ADMINISTRATION)

Field Appraisal
Completed in
September 1951

**



RECEIVED AT CHICAGO

RECEIVED AT CHICAGO

RECEIVED AT CHICAGO
RECEIVED AT CHICAGO
RECEIVED AT CHICAGO
RECEIVED AT CHICAGO
RECEIVED AT CHICAGO

RECEIVED AT CHICAGO
RECEIVED AT CHICAGO
RECEIVED AT CHICAGO
RECEIVED AT CHICAGO
RECEIVED AT CHICAGO

RECEIVED AT CHICAGO
RECEIVED AT CHICAGO
RECEIVED AT CHICAGO
RECEIVED AT CHICAGO
RECEIVED AT CHICAGO

January 14, 1952

Program Analyst
Office of the Administrator

ANALYSIS OF BASIC FACTORS RELATED TO THE
RURAL ELECTRIFICATION LOAN FOR
MICHIGAN 43 CHIPPEWA

SUMMARY

1. The Cloverland Electric Cooperative expects to serve an ultimate number of 5,975 consumers. The appraiser indicated that the cooperative would achieve an ultimate number of 5,500 consumers within the next 10 years. In August 1951 it was serving nearly 3,500 consumers, more than one-half of which were classified as farm.
2. According to respondents in the survey, farm consumers expect to use an average of 4,020 kwh yearly (335 per month) within the next 3 years. Nonfarm residential consumers plan to use 3,352 kwh yearly (279 per month) within the same period. These two estimates are based on the intentions of potential as well as served consumers who were contacted in the sample survey. Presently served town residential consumers indicated they would reach an average of 2,725 kwh yearly (227 per month) within the 3-year period.

In August 1951 actual average farm consumption per month was 128 kwh; for all classes the average was 144 kwh. For the calendar year 1950 farm consumption averaged 124 kwh while the over-all average amounted to 119 kwh.
3. This cooperative is in a unique position of having more than 1000 potential consumers to be added to present consumer load that will not reduce present density nor likely reduce the present average consumption per consumer.
4. The growth in seasonal consumers is likely to be extensive.
5. Of the estimated total kwh requirements for this system within the next 3 years, water heaters are indicated to require more than 37 percent in the case of nonfarm and town residential consumers, and nearly 25 percent in the case of farm consumers.
6. Liquid petroleum gas competition in the cooperative's area is quite aggressive. Forty-two percent of all nonfarm and town residential consumers and 34 percent of the farm consumers are presently using LP gas for one or more purposes.
7. The cooperative's area is noted for its recreational facilities. Tourists come into the area frequently, and during the summer months the traffic is considerable. Definite plans are under way to build a bridge across the Straits of Mackinac. Building of this will bring in many more tourists since one of the drawbacks to touring the area has been the long delays caused by the need to cross the Straits by ferry.

8. Related Economic Factors

Over the period 1940-1950, there has been a decrease of 2.5 percent in population. Dwelling units increased nearly 40 percent. Farms decreased in number from 2,284 to 1,701, and the average size of farm increased from 124 to 158 acres. Dairying is the major type of farm. Some change to beef cattle raising has occurred but this is not likely to become extensive. Tenancy is very low. Farm land was valued at \$39 per acre in 1950. Credit experience has been favorable in the area during recent years.

E. C. Weitzell, Program Analyst
Office of the Administrator

I. LOCATION

This cooperative is located in the eastern part of the Upper Peninsula of Michigan. It is composed of the three easternmost counties--Chippewa, Luce, and Mackinac. Three of the Great Lakes form part of the area boundary--Lake Superior part of the northern boundary, and Lake Huron and Lake Michigan, part of the southern boundary. (See Figure I.)

The headquarters office for the cooperative is located in Sault Ste. Marie, the county seat of Chippewa County. It is located on the St. Marys River, which connects Lake Superior and Lake Huron. Sault Ste. Marie, Ontario, Canada, is located directly across the river and is reached by ferry boat.

II. SOURCE OF DATA USED IN THIS ANALYSIS

The localized information providing a basis for this analysis is the result of a field appraisal that was made of the area served by the Cloverland Electric Cooperative in September, 1951, by Reuben H. Glazier, Agricultural Economist, Office of the Administrator. The appraisal covered all of the area the cooperative expects to serve insofar as was known at the time the appraisal was made. Generalized information contained in this analysis was obtained primarily from the Census of Agriculture. Data used pertain to Chippewa, Luce and Mackinac Counties, Michigan, which form this cooperative's area.

III. DETERMINING THE SAMPLE

A random sample of 1 in 12 was drawn from a list understood to contain all of the active consumers properly classified as to type of consumer. After visiting some of those drawn, the appraiser concluded that this list included all the members ever served by the cooperative and that it was not correct as to present classification of consumers. Of the 123 drawn as farm consumers, 23 were no longer served, 15 were nonfarm residents, 8 were town residents and 77 were still active farm consumers. Substitutes were obtained for those farms no longer being served. Ten of these were located on the same farm and presumably were consumers who had recently moved into the area. Other substitutes were farms located in the same community. A few of these drawn as nonfarm proved to be farm consumers. A total of 100 schedules on farm consumers were obtained which constituted an approximate 6 percent sample of all served farm consumers. Thirty-four nonfarm residential consumers were drawn from the list mentioned above. However, one was a seasonal user, one was disconnected and four were farm consumers. Including those drawn as farms, but found to be nonfarm residential consumers, a total of 38 nonfarm residential consumers are included in this analysis. This was a sample of approximately 9 percent. A 10 percent sample of the active billing list for town residential consumers was drawn.

Together with other consumers drawn that proved to be town residents, a total of 37, or nearly 13 percent, of this class were interviewed. Although a 10 percent sample of active seasonal consumers was drawn only a few were contacted since most of them were not in the area at the time of the appraisal.

For unserved consumers an 8 percent random sample was drawn from two lists, one for the "G" section which is already built but not energized, and the other used in support of the "J" section application. A few schedules were also taken from prospective members not on either of these lists while visiting in the area.

Summarizing, a total of 249 schedules were taken. Excluding seasonal consumers, the over-all sample amounted to about 7 percent of all served consumers.

IV. ULTIMATE NUMBER OF CONSUMERS

A statement signed by the manager of the cooperative which indicates the ultimate number of consumers the cooperative expects to eventually serve is included as Figure II of this report. After studying the cooperative area from the point of view as to number of ultimate consumers, these totals do not appear to be substantially out of line. Very few presently disconnected or idle consumers will take service again and the cooperative will no doubt lose as many presently receiving service as will again be connected from the present idle service class. The manager feels that he has more farm and nonfarm residences along existing lines not now taking service than actually appear to be there. However, without any unelectrified survey maps, or any other definite information as to unserved places, it was difficult to appraise the actual ultimate accurately.

The cooperative is in a unique position having more than a 1000 potential consumers to be added to present consumer load that will not reduce present density, nor likely reduce the present average consumption per consumer.

The growth in number of seasonal consumers has been and is likely to be quite extensive. The estimate of 531 to be added for which no loan funds have been requested appears reasonable. The estimate of 576 farm and nonfarm consumers to be added in the future for which no funds have been requested probably is high since the present loan application covers practically all the new areas not yet served. The estimated gain therefore will need to come mainly from those unserved along existing lines. The ultimate number of consumers billed during any one month should reach 5,500 during the next 10 years.

A. Three Islands to be Served

The major portion of the potential consumers included on tabulations in support of the present loan application are located on Sugar, Neebish and Drummond Islands.

Sugar Island is located within 3 miles of the cooperative's headquarters. There are 62 farms, 50 full time residentials, 25 commercials, 90 summer homes and seasonals, 6 public buildings and one U. S. Government installation--a total of 233 potential consumers on this island. The people here cannot understand why they have never received electric service and a good many reported having signed for service as far back as 1938. There seem to be indications that the farms, homes and other potentials will be as heavy users as the average of the members now served.

Neebish Island will not be as promising an addition to the system as Sugar Island. This island has only 17 farms and 9 other year-round potential consumers. There are 5 potential commercial consumers, 2 of whom operate the year-round, and 70 seasonals. This island can be reached with a short cable extended from existing lines near the island. A number of the potentials indicated that they have also been signed for service since 1938.

Drummond Island is by far the largest of the 3 and is principally a resort island. Virtually no farming is practical on this island at the present time. There are approximately 600 people who live on the island the year-round. Drummond Dolomite Quarry is now operating on the island and gives employment to many persons. There are approximately 250 signed and potential consumers on this island, nearly 100 of these being year-round occupants. Indications of a rather large potential use of electricity is shown in that 12 of the commercials presently use large amounts of electric power which they generate. These commercials are very anxious to get central station service. Five of the large commercials on the island operate 15 kv diesel plants. All of them admit their present plants are overloaded and indicate a greater use when central station service becomes available. Seven small commercials have home plants in operation which vary in size from $1\frac{1}{2}$ kv to 5 kv. A few homes have small home plants. There are 135 seasonal potentials on Drummond Island. A large number of these are exceptionally well built cottages and homes. It is estimated that all of these dwellings cost \$5,000 or more to construct. The summer homes are used for varying lengths of time from 1 up to 6 months. Some of the cabins and cottages are used mainly during the hunting season. The revenue obtained from these seasonals will be determined largely by the annual minimum charge made.

The Dolomite Quarry at present generates its own power. However, the manager of the quarry has informed the cooperative's manager that the quarry will buy all of the surplus power the REA cooperative has to sell. In particular, they would like to use power from this system during the winter months when they are operating only on a limited scale. A condition of this kind would appear desirable since the demand by other consumers on the island will be lowest during the winter months.

B. Other Consumers

Other consumers to be served with funds requested in the present application are on proposed extensions that will be scattered throughout the cooperative's area. These extensions will vary in length from one-half to 13 miles. Total potentials involved in these include 38 farms, 65 year-round nonfarm residences, 83 seasonals, 2 commercials and 2 public buildings. A number of these proposed extensions will be constructed into much less dense areas and in places where the average annual income received by the family is quite low.

C. Future Requirements for Completing Electrification of Area

Completing electrification of the area will be mainly short extensions from existing lines. One exception to this exists to the north of Newberry in Luce County. Fifty potential consumers, consisting of 23 cabins, 19 homes and 8 commercials are located on State Route 48 which connects Newberry with Deer Park on Lake Superior. It will require approximately 35 miles of line to serve these potentials, 9 miles of which would have to parallel lines belonging to the Village of Newberry. To make this line feasible would require purchasing these 9 miles from Newberry, Michigan.

V. ESTIMATED AVERAGE KWH CONSUMPTION TO BE ATTAINED WITHIN THREE YEARS AFTER FIELD APPRAISAL BY CLASS OF CONSUMER

A. Procedure

The basis for the estimate of kwh consumption is data obtained through interviews with the various classes of consumers in the system area who were selected by random sample. Of the 249 completed schedules, 100 were served farms, 31 unserved farms, 38 served nonfarm residentials, 30 unserved nonfarm residentials, 37 served town residentials and 13 were seasonal users. The field appraiser called at the home of each of these respondents and was able to obtain a complete and usable schedule for each of them, or a substitute in a few cases where this was necessary. Each respondent having electric service was asked to indicate the electrically operated equipment and household appliances he was already using and, in addition, those he would add within 3 years. In the case of respondents without electric service at the time of the interview, they were asked to indicate the equipment and appliances they would use within 3 years after receiving electric service, assuming service would be made available in a comparatively short time.

Data obtained by the interviews were tabulated and the appliance density in relation to all consumers making up the sample was calculated. Average kwh consumption per 100 consumers was computed as the summation of the products of the respective appliance densities per 100 consumers and the average annual energy requirements which assumes average use of appliances and equipment.

B. Consumption Estimates

The kwh consumption estimates are summarized by class of consumer in Table I. For detail from which this summary was computed, refer to Tables II, III and IV.

Special attention should be given to the fact that nearly 19 percent of consumers now receiving service from the cooperative are seasonal including summer homes, cottages, cabins, and hunters' club cabins. It is expected that 29 percent of the ultimate consumers will be this type. Out of the 13 seasonal consumers contacted, only 3 are using or expect to use more than 1000 kwh yearly, an amount approximating the maximum allowable usage for the minimum charge. Summary sheets (Form 76-B) on actual kwh use since being energized. show that only

(Consumption Estimates continued on page 13)

TABLE I

SUMMARY OF ESTIMATED KWH CONSUMPTION

| <u>Estimated Kwh Consumption to be Attained in Three Years 1/</u> | | | | | | | |
|---|----------------|-----|------------------------|----------------|----|---------------|----------------|
| Equipment | | : | | | :: | | |
| <u>On Hand</u> | | : | <u>To Be Purchased</u> | | :: | <u>Total</u> | |
| <u>Yearly</u> | <u>Monthly</u> | : | <u>Yearly</u> | <u>Monthly</u> | :: | <u>Yearly</u> | <u>Monthly</u> |
| | | : | | | :: | | |
| <hr/> | | | | | | | |
| 1. <u>Farm Consumers</u> | | | | | | | |
| a. Served | 2,361 | 197 | 1,706 | 142 | | 4,067 | 339 |
| b. Unserved 2/ | --- | --- | 3,868 | 322 | | 3,868 | 322 |
| c. Weighted Average | --- | --- | --- | --- | | 4,020 | 335 |
| 2. <u>Nonfarm Residential Consumers</u> | | | | | | | |
| a. Served | 1,630 | 136 | 1,088 | 91 | | 2,718 | 227 |
| b. Unserved 2/ | --- | --- | 4,155 | 346 | | 4,155 | 346 |
| c. Weighted Average | --- | --- | --- | --- | | 3,352 | 279 |
| 3. <u>Town Residential Consumers</u> | | | | | | | |
| a. Served | 2,077 | 173 | 648 | 54 | | 2,725 | 227 |

Source: Field appraisal completed in September 1951.

- 1/ These estimates were derived on the assumptions that (a) consumers will use electricity at the same rate as the average kwh usage determined by REA for farm and home use of electrical appliances and equipment, and (b) that all the appliances and equipment which was indicated to be purchased, will be in use three years after the field appraisal by consumers not now receiving service as well as those now receiving service.
- 2/ Estimated consumption for appliances and equipment to be purchased within three years after being connected by respondents not now receiving service. Since it is not likely that all of the unserved respondents will be connected immediately, the actual time required to attain the estimated consumption will depend upon when connections are made.

TABLE II

PERCENT OF SERVED FARM CONSUMERS USING AND PLANNING TO USE
ELECTRICAL APPLIANCES AND EQUIPMENT AND ESTIMATED ANNUAL
KWH USAGE PER 100 FARM CONSUMERS WITHIN THREE YEARS
AFTER THE DATE OF THE FIELD APPRAISAL

| Appliance or Equipment | Percent of Consumers | | | Annual Usage Kwh Per Unit | Estimated Annual Kwh Usage | | |
|------------------------------|----------------------|------------|-----------|---------------------------------------|----------------------------|----------|---------|
| | Using | Planning | Using and | | Per 100 Farm Consumers | | |
| | : To Use | : Planning | : to Use | | : Present | : Future | : Total |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| <u>MAJOR USES:</u> | | | | | | | |
| House Lighting | 100 | --- | 100 | 300 | 30,900 | --- | 30,900 |
| General Barn | | | | | | | |
| Lighting | 29 | 2 | 31 | 24 | 696 | 48 | 744 |
| Dairy Barn | | | | | | | |
| Lighting | 57 | 3 | 60 | 35 | 1,995 | 105 | 2,100 |
| Poultry Laying | | | | | | | |
| House Lighting | 31 | 6 | 37 | 35 | 1,085 | 210 | 1,295 |
| Yard Lighting | 72 | 6 | 78 | 18 | 1,512 | 126 | 1,638 |
| Iron | 96 | --- | 96 | 100 | 9,800 | --- | 9,800 |
| Ironer | 3 | 1 | 4 | 120 | 360 | 120 | 480 |
| Radio | 92 | 2 | 94 | 100 | 10,500 | 200 | 10,700 |
| Refrigerator | 74 | 12 | 86 | 360 | 26,640 | 4,320 | 30,960 |
| Range | 15 | 12 | 27 | 1,200 | 18,000 | 14,400 | 32,400 |
| Washing Machine | 87 | --- | 87 | 35 | 3,115 | --- | 3,115 |
| Pres. System | | | | | | | |
| Lift 22' or Less | 25 | 11 | 36 | 180 | 4,680 | 1,980 | 6,660 |
| Pres. System | | | | | | | |
| Lift over 22' | 38 | 16 | 54 | 240 | 9,360 | 3,840 | 13,200 |
| Space Heater | | | | | | | |
| (Supplementary) | 7 | 4 | 11 | 70 | 490 | 280 | 770 |
| Freezer (Cabinet) | 17 | 25 | 42 | 900 | 18,000 | 25,200 | 43,200 |
| Water Heater | 7 | 24 | 31 | 3,000 | 21,000 | 72,000 | 93,000 |
| Welder | 4 | 2 | 6 | 75 | 300 | 150 | 450 |
| Feed Grinder or | | | | | | | |
| Roller | 6 | --- | 6 | 825 | 4,950 | --- | 4,950 |
| Brooder Hover | 21 | 5 | 26 | 266 | 5,586 | 1,330 | 6,916 |
| Brooder Battery | 1 | --- | 1 | 200 | 200 | --- | 200 |
| Milking Machine | 23 | 15 | 38 | 367 | 8,441 | 5,505 | 13,946 |
| Milk Cooler | 24 | 10 | 34 | 1,237 | 29,688 | 12,370 | 42,058 |
| Water Heater | | | | | | | |
| (Dairy) Pres. Type | 3 | 8 | 11 | 2,000 | 6,000 | 16,000 | 22,000 |
| Water Heater | | | | | | | |
| (Dairy) pour-in | -- | 5 | 5 | 1,500 | --- | 7,500 | 7,500 |
| Water Heater (Pail) | 7 | --- | 7 | 300 | 2,100 | --- | 2,100 |
| Clothes Drier | -- | 2 | 2 | 700 | --- | 1,400 | 1,400 |

| Appliance or Equipment | Percent of Consumers | | | Annual Using and Planning Usage Per Unit 2/ | Estimated Annual Kwh Usage | | |
|------------------------------|----------------------|-------------|-------------|--|----------------------------|-------------|-------------|
| | Using | Planning | Using | | Per 100 Farm Consumers | | |
| | To Use | Planning | To Use | | Present | Future | Total |
| | : : : | : : : | : : : | | : : : | : : : | : : : |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |

OTHER LIGHTING:

| | | | | | | | |
|---------------------|-----|-----|----|-----|-----|-----|-----|
| Beef Cattle Barn | 6 | --- | 6 | 12 | 72 | --- | 72 |
| Hog Barn | 1 | --- | 1 | 3 | 3 | --- | 3 |
| Poultry Brooder | | | | | | | |
| House | 13 | 1 | 14 | 5 | 65 | 5 | 70 |
| Milk House | 22 | 3 | 25 | 35 | 770 | 105 | 875 |
| Fruit Packing | | | | | | | |
| House | --- | 5 | 5 | 120 | --- | 600 | 600 |
| Grain & Feed Stor. | | | | | | | |
| Building | 13 | 2 | 15 | 2 | 26 | 4 | 30 |
| Garage | 25 | 6 | 31 | 8 | 200 | 48 | 248 |
| Shop | 14 | 4 | 18 | 12 | 168 | 48 | 216 |
| Bunk House | --- | 1 | 1 | 15 | --- | 15 | 15 |
| Tobacco Barn | 1 | --- | 1 | 10 | 10 | --- | 10 |
| Other Buildings | | | | | | | |
| Pumphouse | 4 | 1 | 5 | 12 | 48 | 12 | 60 |
| Wash and Bath House | 4 | 3 | 7 | 12 | 48 | 36 | 84 |

OTHER HOUSEHOLD USES:

| | | | | | | | |
|--------------------|-----|-----|----|-----|-------|-----|-------|
| Sewing Machine | 7 | 2 | 9 | 10 | 70 | 20 | 90 |
| Household Fan | 13 | --- | 13 | 15 | 195 | --- | 195 |
| Ventilator (Attic) | 2 | --- | 2 | 100 | 200 | --- | 200 |
| Vacuum Cleaner | 43 | 5 | 48 | 20 | 860 | 100 | 960 |
| Heating Pad | 17 | --- | 17 | 3 | 51 | --- | 51 |
| Central Hot Air | | | | | | | |
| Cir. Fan | 2 | --- | 2 | 240 | 480 | --- | 480 |
| Coal Stoker | 4 | --- | 4 | 240 | 960 | --- | 960 |
| Oil Furnace | --- | 1 | 1 | 300 | --- | 300 | 300 |
| Hot Water Cir. | | | | | | | |
| Pump | 1 | --- | 1 | 120 | 120 | --- | 120 |
| Hot Plate | 40 | --- | 40 | 70 | 2,800 | --- | 2,800 |
| Percolator | 21 | --- | 21 | 60 | 1,260 | --- | 1,260 |
| Roaster | 6 | 1 | 7 | 480 | 2,880 | 480 | 3,360 |
| Toaster | 76 | 3 | 79 | 35 | 2,660 | 105 | 2,765 |
| Waffle Iron | 27 | 4 | 31 | 25 | 675 | 100 | 775 |
| Food Mixer | 38 | 10 | 48 | 25 | 950 | 250 | 1,200 |
| Broiler | 1 | --- | 1 | 50 | 50 | --- | 50 |
| Clock | 44 | 1 | 45 | 18 | 954 | 18 | 972 |
| Churn | 2 | --- | 2 | 3 | 6 | --- | 6 |

OTHER WATER PUMPING:

| | | | | | | | |
|--------------------|---|-----|---|-----|-------|-----|-------|
| Livestock Watering | 7 | --- | 7 | 180 | 1,260 | --- | 1,260 |
|--------------------|---|-----|---|-----|-------|-----|-------|

3-Table II - Michigan 43 Chippewa - January 14, 1952

| Appliance or Equipment | Percent of Consumers | | | Annual Using and Planning Usage :Kwh : Per Unit 2/ | Estimated Annual Kwh Usage | | |
|------------------------------|----------------------|------------|----------|---|----------------------------|----------|---------|
| | Using | Planning | Using | | Per 100 Farm Consumers | | |
| | : To Use | : Planning | : To Use | | : Present | : Future | : Total |
| | : (1) | : (2) | : (3) | | : (5) | : (6) | : (7) |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

Source: Field appraisal completed in September 1951.

- 1/ Percent of all served farm consumers who were using or planning to use electrical appliances and equipment listed, within three years after the field appraisal as indicated by interviews with 100 respondents comprising a 6.2 percent random sample selected from tabular lists.
- 2/ Annual kwh average usage as determined by REA. Annual data used to account for seasonal variations.
- 3/ The total estimated annual kwh usage shown in this column does not necessarily equal Column 4, times Column 3. Some consumers have or plan to have more than one of a particular appliance, or more than one of several different appliances.

TABLE III

PERCENT OF SERVED NONFARM CONSUMERS USING AND PLANNING TO USE
ELECTRICAL APPLIANCES AND EQUIPMENT AND ESTIMATED ANNUAL
KWH USAGE PER 100 NONFARM CONSUMERS WITHIN THREE
YEARS AFTER THE DATE OF THE FIELD APPRAISAL

| Appliance or Equipment | Percent of Consumers | | | Annual Kwh Usage Per Unit 2/ | Estimated Annual Kwh Usage | | |
|------------------------------|----------------------|------------|-----------|--|----------------------------|----------|---------|
| | Using: | Planning: | Using and | | Per 100 Nonfarm Consumers | | |
| | : To Use | : Planning | : Usage | | : Present | : Future | : Total |
| | : (1) | : (2) | : (3) | | : (5) | : (6) | : (7) |

MAJOR USES:

| | | | | | | | |
|-------------------|-------|------|-------|-------|--------|--------|---------|
| House Lighting | 100.0 | --- | 100.0 | 300 | 33,150 | --- | 33,150 |
| General Barn | | | | | | | |
| Lighting | 5.3 | --- | 5.3 | 24 | 127 | --- | 127 |
| Poultry Laying | | | | | | | |
| House Lighting | 2.6 | --- | 2.6 | 35 | 91 | --- | 91 |
| Yard Lighting | 29.0 | --- | 29.0 | 18 | 900 | --- | 900 |
| Iron | 89.0 | --- | 89.0 | 100 | 10,000 | --- | 10,000 |
| Ironer | 13.0 | 3.0 | 16.0 | 120 | 1,584 | 312 | 1,896 |
| Radio | 47.0 | --- | 47.0 | 100 | 11,050 | --- | 11,050 |
| Refrigerator | 68.0 | 7.8 | 75.8 | 360 | 25,596 | 2,808 | 28,404 |
| Range | 13.2 | 13.2 | 26.4 | 1,200 | 15,840 | 15,720 | 31,560 |
| Washing Machine | 71.0 | 5.3 | 76.3 | 35 | 2,670 | 186 | 2,856 |
| Pres. System-Lift | | | | | | | |
| 22' or Less | 15.8 | 18.4 | 34.2 | 180 | 2,844 | 3,312 | 6,156 |
| Pres. System-Lift | | | | | | | |
| Over 22' | 13.2 | 13.2 | 26.4 | 240 | 3,168 | 3,144 | 6,312 |
| Space Heater | | | | | | | |
| (Supplementary) | 13.2 | --- | 13.2 | 70 | 924 | --- | 924 |
| Freezer (Cabinet) | 7.8 | 2.6 | 10.4 | 900 | 9,450 | 2,430 | 11,880 |
| Water Heater | 7.8 | 26.3 | 34.1 | 3,000 | 23,700 | 78,900 | 102,600 |

2-Table III- Michigan 43 Chippewa - January 14, 1952

| Appliance or Equipment | Percent of Consumers | | | Annual Kwh Usage Per Unit | Estimated Annual Kwh Usage | | |
|------------------------------|----------------------|------------|-----------|---------------------------------------|----------------------------|--------|-------------|
| | Using | Planning | Using and | | Present | Future | Total |
| | : To Use | : Planning | : Usage | | : Use | : Use | : Estimated |
| | : (1) | : (2) | : (3) | | : (5) | : (6) | : (7) |

MAJOR USES: (Cont'd)

| | | | | | | | |
|---------------------------|-----|-----|-----|-----|-------|-----|-------|
| Feed Grinder or Roller | --- | 2.6 | 2.6 | 50 | --- | 130 | 130 |
| Brooder Hover | 2.6 | --- | 2.6 | 108 | 281 | --- | 281 |
| Clothes Drier | 2.6 | --- | 2.6 | 700 | 1,820 | --- | 1,820 |

OTHER LIGHTING:

| | | | | | | | |
|------------|------|-----|------|----|-----|-----|-----|
| Garage | 5.2 | 5.2 | 10.4 | 8 | 42 | 42 | 84 |
| Shop | 2.6 | 2.6 | 5.2 | 12 | 32 | 30 | 62 |
| Bunk House | 2.6 | --- | 2.6 | 15 | 39 | --- | 39 |
| Woodshed | 2.6 | --- | 2.6 | 12 | 31 | --- | 31 |
| Cabins | 10.5 | --- | 10.5 | 12 | 442 | --- | 442 |

OTHER HOUSEHOLDUSES:

| | | | | | | | |
|-----------------------------|------|-----|------|-----|-------|-----|-------|
| Sewing Machine | 10.5 | 2.6 | 13.1 | 10 | 105 | 27 | 132 |
| Household Fan | 7.8 | --- | 7.8 | 15 | 158 | --- | 158 |
| Vacuum Cleaner | 36.8 | 2.6 | 39.4 | 20 | 736 | 54 | 790 |
| Heating Pad | 21.0 | 5.3 | 26.3 | 3 | 63 | 16 | 79 |
| Central Hot Air Cir. Fan | 2.6 | 2.6 | 5.2 | 240 | 648 | 624 | 1,272 |
| Oil Furnace | 10.5 | --- | 10.5 | 300 | 3,150 | --- | 3,150 |
| Hot Plate | 42.1 | 2.6 | 44.7 | 70 | 2,947 | 182 | 3,129 |
| Percolator | 13.2 | 2.6 | 15.8 | 60 | 792 | 156 | 948 |
| Roaster | 10.5 | --- | 10.5 | 480 | 5,040 | --- | 5,040 |
| Toaster | 68.4 | 5.3 | 73.7 | 35 | 2,394 | 186 | 2,580 |
| Waffle Iron | 23.7 | 2.6 | 26.3 | 25 | 593 | 65 | 658 |
| Food Mixer | 36.8 | 2.6 | 39.4 | 25 | 920 | 68 | 988 |
| Broiler | 2.6 | --- | 2.6 | 50 | 130 | --- | 130 |
| Clock | 21.0 | --- | 21.0 | 18 | 380 | --- | 380 |
| Germicidal Lamp | 2.6 | --- | 2.6 | 100 | 260 | --- | 260 |

OTHER FARM SHOP:

| | | | | | | | |
|-----------------|------|-----|------|----|-----|-----|-----|
| Air Compressor | 5.3 | 2.6 | 7.9 | 35 | 186 | 91 | 277 |
| Drill Press | 10.6 | 2.6 | 13.2 | 12 | 158 | 63 | 221 |
| Tool Grinder | 7.9 | 2.6 | 10.5 | 25 | 198 | 65 | 263 |
| Power Saw | 13.2 | 5.2 | 18.4 | 12 | 158 | 126 | 284 |
| Battery Charger | 2.6 | --- | 2.6 | 12 | 31 | --- | 31 |
| Lathe | 2.6 | 2.6 | 5.2 | 12 | 31 | 64 | 95 |
| Soldering Iron | 7.9 | 2.6 | 10.5 | 15 | 119 | 39 | 158 |

| | | | |
|---|---------|---------|---------|
| TOTAL ANNUAL KWH USAGE PER 100 SERVED NONFARM CONSUMERS | 162,978 | 108,840 | 271,818 |
| ANNUAL KWH USAGE PER CONSUMER | 1,630 | 1,088 | 2,718 |
| MONTHLY KWH USAGE PER CONSUMER | 136 | 91 | 227 |

Source: Field Appraisal completed in September 1951.

- 1/ Percent of all served nonfarm consumers who were using or planning to use electrical appliances and equipment listed within three years after the field appraisal as indicated by interviews with 38 respondents comprising a 9.0 percent random sample selected from tabular lists.
- 2/ Annual kwh average usage as determined by REA. Annual data used to account for seasonal variations.
- 3/ The total estimated annual kwh usage shown in this column does not necessarily equal Column 4 times Column 3. Some consumers have or plan to have more than one of a particular appliance, or more than one of several different appliances.

TABLE IV

PERCENT OF SERVED TOWN RESIDENTIAL CONSUMERS USING AND PLANNING TO USE ELECTRICAL APPLIANCES AND EQUIPMENT AND ESTIMATED ANNUAL KWH USAGE PER 100 TOWN RESIDENTIAL CONSUMERS WITHIN THREE YEARS AFTER THE DATE OF THE FIELD APPRAISAL

| Appliance or Equipment | Percent of Consumers | | | Annual Kwh Usage Per Unit 2/ | Estimated Annual Kwh Usage | | |
|------------------------------|----------------------|------------|--------------------|--|------------------------------------|----------|-------------|
| | Using | Planning | Using and Planning | | Per 100 Town Residential Consumers | | |
| | : To Use | : Planning | : To Use 1/ | | : Present | : Future | : Total |
| | : | : | : | | : Use | : Use | : Estimated |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |

MAJOR USES:

| | | | | | | | |
|-------------------|-----|-----|-----|-------|--------|-------|--------|
| House Lighting | 100 | --- | 100 | 300 | 30,000 | --- | 30,000 |
| Poultry Laying | | | | | | | |
| House Lighting | 5 | --- | 5 | 35 | 175 | --- | 175 |
| Yard Lighting | 19 | --- | 19 | 18 | 342 | --- | 342 |
| Iron | 95 | --- | 95 | 100 | 9,700 | --- | 9,700 |
| Ironer | 13 | 3 | 16 | 120 | 1,560 | 360 | 1,920 |
| Radio | 51 | --- | 51 | 100 | 9,500 | --- | 9,500 |
| Refrigerator | 89 | 5 | 94 | 360 | 33,120 | 1,800 | 34,920 |
| Range | 24 | 8 | 32 | 1,200 | 28,800 | 9,600 | 38,400 |
| Washing Machine | 89 | --- | 89 | 35 | 3,115 | --- | 3,115 |
| Pres. System-Lift | | | | | | | |
| 22' or Less | 24 | 11 | 35 | 180 | 4,320 | 1,980 | 6,300 |
| Pres. System-Lift | | | | | | | |
| Over 22' | 30 | 8 | 38 | 240 | 7,200 | 1,920 | 9,120 |
| Space Heater | | | | | | | |
| (Supplementary) | 14 | --- | 14 | 70 | 980 | --- | 980 |
| Freezer (Cabinet) | 8 | 8 | 16 | 900 | 7,200 | 7,200 | 14,400 |

| Appliance or Equipment | <u>Percent of Consumers</u> | | | <u>Annual</u> | <u>Estimated Annual Kwh Usage</u> | | |
|------------------------------|-----------------------------|--------------------|------------------|------------------|---|------------------------|-----|
| | <u>Using</u> | <u>Planning</u> | <u>Using and</u> | <u>Kwh</u> | <u>Per 100 Town Residential Consumers</u> | | |
| | <u>: To Use</u> | <u>: Planning</u> | <u>: Usage</u> | <u>: Present</u> | <u>: Future</u> | <u>: Total</u> | |
| | <u>:</u> | <u>: To Use 1/</u> | <u>: Per</u> | <u>: Use</u> | <u>: Use</u> | <u>: Estimated</u> | |
| | <u>:</u> | <u>:</u> | <u>: Unit 2/</u> | <u>:</u> | <u>:</u> | <u>: Future Use 3/</u> | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |

MAJOR USES: (Cont'd)

| | | | | | | | |
|------------------------|-----|-----|----|-------|--------|--------|--------|
| Water Heater | 14 | 14 | 23 | 3,000 | 42,000 | 39,000 | 81,000 |
| Water Heater (Pail) | 3 | --- | 3 | 300 | 900 | --- | 900 |
| Clothes Drier | --- | 3 | 3 | 700 | --- | 2,100 | 2,100 |

OTHER LIGHTING:

| | | | | | | | |
|-----------|----|-----|----|----|-----|-----|-----|
| Wood Shed | 8 | --- | 8 | 12 | 96 | --- | 96 |
| Cabin | 5 | --- | 5 | 12 | 60 | --- | 60 |
| Garage | 22 | 3 | 25 | 8 | 176 | 16 | 192 |

OTHER HOUSEHOLDUSES:

| | | | | | | | |
|--------------------|----|-----|----|-----|-------|-----|-------|
| Sewing Machine | 3 | --- | 3 | 10 | 30 | --- | 30 |
| Ventilator (Attic) | 3 | --- | 3 | 100 | 300 | --- | 300 |
| Household Fan | 14 | --- | 14 | 15 | 210 | --- | 210 |
| Vacuum Cleaner | 65 | 5 | 70 | 20 | 1,300 | 100 | 1,400 |
| Heating Pad | 43 | --- | 43 | 3 | 129 | --- | 129 |
| Central Hot Air | | | | | | | |
| Cir. Fan | 5 | --- | 5 | 240 | 1,200 | --- | 1,200 |
| Coal Stoker | 5 | --- | 5 | 240 | 1,200 | --- | 1,200 |
| Oil Furnace | 16 | --- | 16 | 300 | 4,800 | --- | 4,800 |
| Hot Plate | 35 | --- | 35 | 70 | 2,450 | --- | 2,450 |
| Percolator | 24 | --- | 24 | 60 | 1,440 | --- | 1,440 |
| Toaster | 95 | --- | 95 | 35 | 3,325 | --- | 3,325 |
| Roaster | 14 | --- | 14 | 480 | 6,720 | --- | 6,720 |
| Waffle Iron | 49 | --- | 49 | 25 | 1,225 | --- | 1,225 |
| Food Mixer | 43 | 14 | 57 | 25 | 1,075 | 350 | 1,425 |
| Clock | 38 | --- | 38 | 18 | 738 | --- | 738 |

FARM SHOP:

| | | | | | | | |
|-----------------|-----|-----|----|----|-----|-----|-----|
| Drill Press | 11 | 3 | 14 | 12 | 132 | 36 | 168 |
| Tool Grinder | 8 | 5 | 13 | 25 | 200 | 150 | 350 |
| Power Saw | 8 | 5 | 13 | 12 | 96 | 72 | 168 |
| Lathe | 3 | --- | 3 | 12 | 36 | --- | 36 |
| Soldering Iron | 5 | --- | 5 | 15 | 75 | --- | 75 |
| Headbolt Heater | --- | 5 | 5 | 15 | --- | 75 | 75 |
| Planer | 3 | --- | 3 | 12 | 36 | --- | 36 |

OTHER:

| | | | | | | | |
|-------------------|---|-----|---|-----|-------|-----|-------|
| Combination Range | 3 | --- | 3 | 600 | 1,800 | --- | 1,800 |
|-------------------|---|-----|---|-----|-------|-----|-------|

TOTAL ANNUAL KWH USAGE PER 100 TOWN

| | | | | | | |
|--------------------------------|--|--|--|---------|--------|---------|
| RESIDENTIAL CONSUMERS | | | | 207,761 | 64,759 | 272,520 |
| ANNUAL KWH USAGE PER CONSUMER | | | | 2,077 | 648 | 2,725 |
| MONTHLY KWH USAGE PER CONSUMER | | | | 173 | 54 | 227 |

Source: Field appraisal completed in September 1951.

- 1/ Percent of all served town residential consumers who were using or planning to use electrical appliances and equipment listed, within three years after the field appraisal as indicated by interviews with 37 respondents comprising a 12.6 percent random sample selected from tabular lists.
- 2/ Annual kwh average usage as determined by REA. Annual data used to account for seasonal variations.
- 3/ The total estimated annual kwh usage shown in this column does not necessarily equal Column 4 times Column 3. Some consumers have or plan to have more than one of a particular appliance, or more than one of several different appliances.

B. Consumption Estimates (Continued from page 4)

3 out of 26 of this class of consumer are currently using more than the annual minimum. Considering that an approximate 20 percent of small commercials are seasonal, it can be realized that total annual revenue depends substantially on the annual minimum charge made for seasonals. In the past the cooperative has been billing on a 6-month basis for many of the seasonals with an annual minimum of 20 dollars. This involved the expense of disconnecting and connecting, and considerable dissatisfaction on the part of consumers was created since they were not always able to get their service connected when they wanted it. The cooperative's manager is endeavoring to get an annual minimum designed on a higher rate which will eliminate the necessity of disconnecting and reconnecting services. The seasonal commercials increase the annual peak load since their demand is highest at the time when the greatest demand is made by other consumers. The manager is working with Rate Section, Management Division of REA to determine a more satisfactory arrangement for seasonal users in the cooperative.

VI. RELATED CONSUMPTION DATA

A. Electric Energy Sales

For comparative purposes related statistics taken from the cooperative's monthly operating report for August 1951 are shown below:

| <u>Class</u> | <u>Consumers Number</u> | <u>Percent Minimum Bills</u> | <u>Average Kwh</u> | <u>Average Size of Bill</u> |
|------------------|-----------------------------|----------------------------------|------------------------|---------------------------------|
| Farms* | 2,045 | 19.2 | 128 | \$ 5.35 |
| Town Residential | 293 | 16.0 | 119 | 4.92 |
| Small Commercial | 343 | 9.6 | 432 | 14.79 |
| Large Commercial | 1 | --- | 12,480 | 238.00 |
| P. S. Lights | 10 | 90.0 | 140 | 22.07 |
| P. Buildings | 128 | 57.8 | 151 | 5.88 |
| Seasonal | 646 | 100.0 | --- | 3.25 |
| Total | 3,456 | 38.6 | 144 | 6.00 |

* Includes 434 nonfarm residentials billed on same rate as farms.

On August 31, 1951, the cooperative had a total of 1,041 miles of energized line. For active consumers the density was 3.3 per mile; for all consumers, 3.7 per mile. Three hundred and sixty-one consumers were disconnects.

B. Expected Major Uses of Electricity

The more important kinds of electrical appliances and equipment according to the percentage of total kwh load to be attained within 3 years after the field appraisal are shown in Table V. It should be noted that for farm consumers, the appliances shown will account for about 65 percent of the estimated farm consumption. For the nonfarm and town residential consumers it is about 71 percent of the estimated consumption for nonfarm and town residential consumers. The relationship between this load and the density of appliances which will account for it is shown in Figure III. From this figure it is possible to see in a general way how the total load can be raised through increasing the number of the respective appliances per 100 consumers.

TABLE V

EXPECTED MAJOR USES OF ELECTRICITY 1/

| <u>Appliance or Equipment</u> | <u>Farm Consumers</u> | | <u>Nonfarm and Town Residential Consumers</u> | |
|-------------------------------|-----------------------|-------------------|---|-------------------|
| | <u>Estimated</u> | <u>Percent of</u> | <u>Estimated</u> | <u>Percent of</u> |
| | <u>Total Kwh</u> | <u>Total Load</u> | <u>Total Kwh</u> | <u>Total Load</u> |
| Water Heaters | 99,000 | 24.6 | 117,000 | 37.4 |
| Freezer Cabinets | 44,100 | 11.0 | 28,260 | 9.0 |
| Milk Coolers | 36,008 | 9.0 | --- | --- |
| Ranges | 31,200 | 7.8 | 34,200 | 10.9 |
| Refrigerators | 30,960 | 7.7 | 29,484 | 9.4 |
| Water Pres. Systems | 19,838 | 4.9 | 14,382 | 4.6 |

1/ Source: Field appraisal completed in September 1951.

C. Increase in Consumption Since Energization

The actual kwh consumption of all served farm consumers, as shown by the billing record data for 99 of the 100 respondents, is shown below. Billing records for the other consumer were not included as he was not connected at least six months in one calendar year.

| Total No. of Years With Electricity | Number of Schedules | Average Monthly Kwh Consumption by 12-Month Period 1/ | | | | | | | | | | | | |
|---|---------------------------|--|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|
| | | 1st | 2nd | 3rd | 4th | 5th | 6th | 7th | 8th | 9th | 10th | 11th | 12th | 13th |
| 1 | 12 | 134 | | | | | | | | | | | | |
| 2 | 0 | --- | --- | | | | | | | | | | | |
| 3 | 13 | 108 | 111 | 122 | | | | | | | | | | |
| 4 | 22 | 62 | 90 | 98 | 115 | | | | | | | | | |
| 5 | 8 | 43 | 51 | 53 | 47 | 61 | | | | | | | | |
| 6 | 3 | 92 | 90 | 95 | 117 | 126 | 144 | | | | | | | |
| 7 | 6 | 47 | 61 | 73 | 85 | 103 | 113 | 123 | | | | | | |
| 8 | 5 | 70 | 68 | 81 | 194 | 241 | 278 | 374 | 395 | | | | | |
| 9 | 3 | 32 | 39 | 63 | 62 | 67 | 132 | 170 | 219 | 246 | | | | |
| 10 | 4 | 29 | 28 | 30 | 34 | 55 | 51 | 81 | 87 | 92 | 102 | | | |
| 11 | 5 | 35 | 36 | 34 | 70 | 76 | 96 | 77 | 92 | 120 | 158 | 181 | | |
| 12 | 4 | 36 | 43 | 49 | 81 | 115 | 148 | 165 | 227 | 209 | 221 | 265 | 252 | |
| 13 | 14 | 40 | 46 | 51 | 64 | 91 | 106 | 103 | 112 | 128 | 150 | 188 | 219 | 220 |

- 1/ The first year's usage was determined from the average monthly kwh consumption for consumers connected 6 or more months at the end of the year. The last year's usage was determined from the average monthly kwh consumption for consumers who were connected at the beginning of 1951.

The actual kwh consumption of all served nonfarm and town residential consumers, as shown by the billing record data for 72 of the 75 respondents, is shown below. Billing records for the other 3 consumers were not included as they were not connected at least 6 months in one calendar year.

| Total No. of Years With Electricity | Number of Schedules | Average Monthly Kwh Consumption by 12-Month Period 1/ | | | | | | | | | | | | |
|---|---------------------------|--|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|
| | | 1st | 2nd | 3rd | 4th | 5th | 6th | 7th | 8th | 9th | 10th | 11th | 12th | 13th |
| 1 | 8 | 100 | | | | | | | | | | | | |
| 2 | 4 | 218 | 337 | | | | | | | | | | | |
| 3 | 9 | 68 | 62 | 54 | | | | | | | | | | |
| 4 | 13 | 62 | 79 | 80 | 84 | | | | | | | | | |
| 5 | 2 | 55 | 67 | 98 | 104 | 122 | | | | | | | | |
| 6 | 7 | 93 | 135 | 148 | 134 | 142 | 155 | | | | | | | |
| 7 | 4 | 35 | 41 | 57 | 74 | 67 | 71 | 75 | | | | | | |
| 8 | 2 | 112 | 87 | 86 | 204 | 257 | 455 | 496 | 440 | | | | | |
| 9 | 2 | 27 | 32 | 36 | 42 | 45 | 39 | 49 | 53 | 56 | | | | |
| 10 | 3 | 61 | 78 | 72 | 76 | 32 | 43 | 34 | 47 | 46 | 47 | | | |
| 11 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 12 | 5 | 19 | 24 | 30 | 28 | 32 | 33 | 37 | 64 | 122 | 127 | 146 | 142 | |
| 13 | 13 | 48 | 57 | 64 | 76 | 83 | 89 | 92 | 103 | 119 | 120 | 159 | 178 | 170 |

- 1/ The first year's usage was determined from the average monthly kwh consumption for consumers connected 6 or more months at the end of the year. The last year's usage was determined from the average monthly kwh consumption for consumers who were connected at the beginning of 1951.

VII. LIQUID PETROLEUM GAS COMPETITION

Liquid petroleum gas dealers in the cooperative area are quite aggressive in their efforts to sell LP gas appliances. They have succeeded very well in their efforts, particularly in combination ranges. These dealers do not have much of an advantage from a price standpoint since 100-pound pressure tanks sell for from \$8.50 to as high as \$10.50, depending upon the location.

There is an installation charge of from \$15.00 to \$25.00. Consumers using as little as 80 kwh monthly can satisfy their energy needs for the same cost. Membership education has not been effective in this cooperative area, and a high percent of members do not know the comparative costs of energy from the two sources. Area consumers often buy from the supplier who makes an effort to sell them and the LP dealers are doing this most effectively.

The town and nonfarm residential consumers in the cooperative area are using LP gas at a much higher degree than farm consumers. From the 236 schedules (excluding seasonals) taken during the appraisal, it was found that 137, or 58 percent, were not using or planning to use LP gas. Eighty-three, or 35 percent, were using or planning to use ranges; 19, or 8 percent, water heaters and 10, or 4 percent, refrigerators. From the 131 farm schedules completed, 87, or 66 percent, show no use of LP gas. Thirty-three, or 25 percent, were using or planning to use ranges and 8, or 6 percent, gas water heaters. For nonfarm residential consumers out of 68 schedules, 33, or 49 percent, were not using or planning to use LP gas; 32, or 47 percent, were using LP gas ranges; 10, or 15 percent, were using or planning to use gas refrigerators; and 2, or 3 percent, gas water heaters. For town residential consumers 17 out of 37, or 46 percent were not using or planning to use LP gas; but 18, or 49 percent, were using LP gas ranges; and 9, or 24 percent, were using or planning to use LP gas water heaters. Thus it is concluded that LP gas competition definitely exists. An aggressive membership education and power use program appears to be needed to prevent the continuance of the trend which is evident.

VIII. RELATED ECONOMIC FACTORS

A. History

Agricultural practices involving extensive use of land in this area is comparatively recent notwithstanding the fact that Sault Ste. Marie, Michigan is one of the oldest settlements in the State. Settlement began in the seventeenth century and through the years this area was occupied by explorers, missionaries, fur traders, adventurers and soldiers. Excessive cutting of timber began about 1870. Lumber camp inhabitants began to clear up small acreages for cultivation. In 1870, 117 farms were listed in Chippewa County. This number increased to as high as 1,730 in 1925, but has been decreasing since. The 1950 census show only 1,154 farms in that county.

B. Population Changes

Settlement is not uniform over the area. The northern half of Luce County is sparsely settled. Only a few permanent residences including small cabins and cottages exist, principally along State Route 48 which connects Newberry with Deer Park on Lake Superior. In Chippewa, Mackinac and the lower half of Luce Counties, the settlement is mainly along the surfaced roads and in small farming areas. The Marquette National Forest covers about one-third of Chippewa and Mackinac Counties and settlement in this area is virtually nil.

Dwelling Units and Population Changes 1/

| <u>County</u> | <u>Dwelling Units</u> | | | <u>Population</u> | | |
|---------------|-----------------------|-------------|-----------------------|-------------------|-------------|-----------------------|
| | <u>1940</u> | <u>1950</u> | <u>Percent Change</u> | <u>1940</u> | <u>1950</u> | <u>Percent Change</u> |
| Chippewa 2/ | 3,607 | 5,212 | 44.4 | 11,960 | 11,186 | - 6.4 |
| Luce 2/ | 1,596 | 1,921 | 16.9 | 4,691 | 5,335 | 13.7 |
| Mackinac 2/ | 3,577 | 5,082 | 42.0 | 6,769 | 6,291 | - 7.1 |
| Total | 8,780 | 12,215 | 39.1 | 23,420 | 22,812 | - 2.5 |

1/ Source: U. S. Bureau of Census

2/ Does not include Sault Ste. Marie, Newberry and St. Ignace, Michigan

C. Farming in the Areas1. Size of Farms 1/

The number of farms are growing smaller each year as the average size becomes larger.

| <u>County</u> | <u>Number</u> | | | <u>Size</u> | | |
|---------------|---------------|-------------|-------------|-------------|-------------|-------------|
| | <u>1940</u> | <u>1945</u> | <u>1950</u> | <u>1940</u> | <u>1945</u> | <u>1950</u> |
| Chippewa | 1,584 | 1,445 | 1,154 | 127.1 | 134.4 | 162.3 |
| Luce | 189 | 297 | 158 | 131.7 | 113.4 | 179.2 |
| Mackinac | 511 | 448 | 389 | 112.1 | 120.2 | 137.3 |
| Totals | 2,284 | 2,190 | 1,701 | 124.1 | 130.6 | 158.2 |

1/ Source: U. S. Bureau of Census

2. Farms in the Area Classified by Type 1/

| <u>Type</u> | <u>Counties</u> | | | <u>Three Counties</u> | <u>Percent of Total</u> |
|---|-----------------|-------------|-----------------|---------------------------|-----------------------------|
| | <u>Chippewa</u> | <u>Luce</u> | <u>Mackinac</u> | | |
| Dairy | 339 | 43 | 155 | 527 | 31.0 |
| General | 235 | 14 | 37 | 286 | 16.8 |
| Field Crops | 60 | 15 | 10 | 85 | 5.0 |
| Livestock other than Dairy and Poultry | 51 | -- | 24 | 75 | 4.4 |
| Poultry | 32 | -- | 5 | 37 | 2.2 |
| Vegetable | 5 | -- | -- | 5 | 0.3 |
| Fruits and Nuts | 5 | -- | -- | 5 | 0.3 |
| Unclassified | 427 | 86 | 158 | 681 | 40.0 |
| Totals | 1,154 | 158 | 389 | 1,701 | 100.0 |

1/ Source: U. S. Bureau of Census of Agriculture for 1950.

Dairying is the leading farm enterprise and because of the limited amount of cleared land and the long cold winters, this enterprise is likely to remain as a leading one. Many farmers in the area would like to change to beef cattle production and some of the larger units have discarded dairying in preference to beef cattle. The small amount of cleared land for cultivation and meadows will keep beef cattle production from fully replacing the dairy herds. There are no prospects for increasing other livestock. The area could economically produce more poultry and eggs since local production does not satisfy local demand. Hay and potatoes are the main field crops and will remain so since the climate and soils are most suited for them.

3. Farm Tenancy

Farm tenancy has always been very low in the area. There are some part owners but very few tenants. The percent of tenancy was only 2.5 in Luce and Chippewa Counties and 1.0 in Mackinac County according to the 1950 preliminary Census of Agriculture.

4. Farm Financial Pattern(a) Value of Land and Buildings 1/

The trends in value of land and buildings per farm and per acre are shown as follows:

| <u>County</u> | <u>Per Farm</u> | | | <u>Per Acre</u> | | |
|---------------|-----------------|-------------|-------------|-----------------|-------------|-------------|
| | <u>1940</u> | <u>1945</u> | <u>1950</u> | <u>1940</u> | <u>1945</u> | <u>1950</u> |
| Chippewa | \$2,603 | \$3,245 | \$6,023 | \$20.49 | \$23.62 | \$37.46 |
| Luce | 3,443 | 2,968 | 6,558 | 26.14 | 26.18 | 39.67 |
| Mackinac | 2,338 | 2,969 | 6,489 | 20.87 | 24.69 | 44.68 |
| Average | 2,613 | 3,153 | 6,182 | 21.06 | 24.14 | 39.08 |

1/ Source: U. S. Bureau of Census

(b) Mortgage Situation

The farmers in this area are in good condition as measured by the status of farm mortgages. The secretary-treasurer for the National Farm Loan Association in the Upper Peninsula of Michigan reported that there were only 115 Federal Land Bank loans, and 75 Land Bank Commissioner loans outstanding in the Sault Ste. Marie area. He reported a few new loans being made by the association but the rate of repayments up to this time has been greater than that of new loans made. Most of the present applications are for more money than the association can lend. It took quite heavy losses from loans made when it was first formed (during the depression years of the thirties) mainly because too large a loan was made when the average size of the farm was too small. Thus the borrower did not have a large enough enterprise from which to realize sufficient income to meet payments on the loan. The secretary-treasurer reported that some of the banks as well as some individuals are presently making farm real estate loans. The banks did not show a very high percentage of their loans to be for farm real estate. Commercial bank loans on the average were quite small. No information was obtained on loans made by individuals, but bankers and agricultural leaders indicated that relatively few of the farmers were in debt on their land.

The local Farmers Home Administration county supervisor reported only two real estate mortgages held by them. He also reported little demand for farm operation loans.

A fieldman for the Production Credit Associations in the Upper Peninsula of Michigan reported a very active program in the Sault Ste. Marie area. Loans in the Upper Peninsula at the present time total in number only 289, aggregating an amount of about one-half million dollars. Short term credit is demanded in this area for feeder cattle and machinery and in some instances for purchases of dairy cattle. The three banks in the farming area reported a considerable amount of lending to farmers principally for the purchase of livestock and machinery.

D. Farm Income

The growing season in this area is very short. Enterprises are limited to those suitable to such a short season and cold climate. Hay (particularly the clovers) thrives in the area and during the past, a large tonnage of hay has been shipped out of the area. A change-over to mechanical farming throughout the nation has substantially reduced this market. However, considerable amounts of hay are shipped to race horse farms and other like specialized markets. The county agent reported 2,500 carloads of hay shipped out of Chippewa County in 1950.

Livestock production has increased and more and more of the hay produced is being fed on the farm. Dairying is the leading enterprise and is on the increase in the area. There is a tendency on the part of some farmers to turn to beef cattle production mainly because they are seeking an enterprise with less work than dairying. The farms are rather small on the average for beef cattle production, but the county agent asserts that despite this fact, beef cattle production is on the increase.

Potato production is adaptable to the sandy soils in parts of the area. This has been and still is the leading cash crop. The total acreage fell considerably when government support prices were removed. However, the adaptability of soil to this crop will allow it to continue as a leading source of cash farm income in this area.

According to the 1950 Census of Agriculture about 18 percent of the farm operators in the area reported no sales or had incomes from products sold amounting to less than \$250; only about 11 percent had sales of over \$4,000. Thus the bulk (71 percent) of the farm operators have farm incomes ranging from \$250 to \$4,000 yearly.

E. Off-Farm Employment

In 1949, a total of 924 farm operators, or nearly 54 percent, reported working off farm; 569, or nearly 33 percent, reported working off farm 100 days or more during the year. Nearly 40 percent reported other income of family exceeding value of agricultural income.

The processing of lumber and other forest products is the main source of off-farm employment. The Boston substation area is in the copper country; thus a good many of the cooperative's membership located in this area work in copper mines and processing plants.

F. Bank Deposits and Loans

The four largest banks in the area, three at Sault Ste. Marie, and one at St. Ignace, estimate less than 20 percent of their total deposits and loans to be rural. These 4 banks show total deposits of nearly 17 million dollars and loans of over 6 million dollars as of June 30, 1951. The loan ratio was 2.7 to 1. Three other banks located within the cooperative's area are the Newberry State Bank in Luce County, Pickford Private Bank and the Rudyard State Bank. The latter 2 are located in the better farming area of Chippewa County and report from 40 to 50 percent of their total deposits and loans to be with farmers and other rural residents. Total deposits in these 3 banks show over 5 million dollars and total loans of nearly 2 million. The loan and ratio here is practically the same as given for the larger banks. The 3 last mentioned banks report an average of 40 thousand dollars in farm real estate loans; the 4 large banks report an average of less than 20 thousand dollars.

G. Marketing Outlets and Facilities

Sault Ste. Marie, Michigan and Sault Ste. Marie, Canada create a greater demand for poultry, eggs, and fresh vegetables than is produced in the area. Detroit and other industrial cities to the south provide a market for surplus dairy products and potatoes. The cheese factory at Pickford has a \$300,000 capital investment. It had been a creamery since 1929 but in 1950 the change was made. The Rudyard Cooperative Creamery and Cheese Factory was constructed in 1950 and the volume of business is on the increase. Sault Ste. Marie has a Grade A milk plant and a cheese factory to take care of the surplus milk. Also, there are several other small cheese plants which provide ready markets for all dairy products and sufficient competition for the products to allow the farmers a good price.

The livestock auction market located at Rudyard is accessible to all parts of the cooperative area. Railroad facilities are adequate. The Minneapolis-St. Paul Railroad Company and the South Shore and Atlantic Railroad Company serve the area. Water transportation on the Great Lakes is available and commonly used. Federal and State trunk line highways transverse the area. The Kinross Airport is available for air service to all points. This is a large combined army and commercial airport. It is vital to the protection of the Sault Ste. Marie Locks. More than 3 million dollars is to be spent for further development of this airport in the immediate future. The appraiser learned that more ships go through these Locks than in all the other locks located in other parts of the world combined.

IX. PHYSICAL CHARACTERISTICS

A. Soil Types. Topography and Cover

Approximately 20 percent of the farm area is composed of Ontonagon soils with parts of Brimley very fine sandy loams, Bergland silt loam and Bruce silt loam. These are soils of comparatively high fertility. The land is level or gently undulating; not excessively stony or swampy. Some do require artificial drainage for cultivated crops. Approximately four-fifths of this land is cleared. The part not cultivated is stump pasture. The remaining 20 percent has a fair second growth of aspen, fir, spruce, cedar, hemlock, white pine, elm, ash and sugar maple.

A second 20 percent of the farm area is made up of Blue Lake sandy loam, Bruce, Bergland, Bohemian, Emmet and Kalkaska soils. There is also some Onaway stony loam, Longrie stony loam, Munising stony loam and a little of Ewen soils. These are soils of medium to high productivity but depreciated because of excessive stoniness, poor drainage or both. About one-fifth of this second group is cleared and cultivated. The remainder is abandoned to second growth pine, hemlock and aspen.

The remaining 60 percent of the farm area is made up mainly of Rubicon, Wallace and Strong's soils, Eastport, Waiska, Newton, Gravely and Trout soils with considerable peats and mucks. These are soils of low

productivity, usually dry or swampy, excessively stony or rough mucks and peats. These areas are largely covered with aspen, cherry, white birch and slow-growing oaks.

From the above description it can be summarized that soils are characterized by a great diversity as to texture, drainage, chemical composition and productivity. Some soils are loose, incoherent dry sands and others composed of silts and clays.

The farming areas are confined to the Sault Ste. Marie, Pickford and Rudyard areas in Chippewa County and to Moran, Allenville, and Engadine areas in Mackinac County. There are some organic soils composed of peats and mucks which offer potential agricultural development in the future.

Physiographically the area is located in the Great Plains region. The details of relief were constructed during the glacial period. The entire area includes plains, plateau-like hills, some of which are strewn with boulders and fragmental blocks of limestone and interspersed with swamps.

The 3 large islands off the eastern coast of Chippewa County--Sugar, Neebish and Drummond, have very similar soils, cover and topography to that of the mainland. The general elevation of the lower lands bordering the Great Lakes ranges from 610 to 650 feet above sea level; the higher plains from 700 to 800 feet, and most of the higher lands in the western part of Chippewa from 800 to 900 with a very few locations 950 feet above sea level. Lake Superior is approximately 600 feet above sea level.

B. Natural Resources

1. Forest and Wooded Areas

The main off-farm source of income in the area is from employment in the woods and forests. More than 70 percent of the area is covered with timber of varying kinds and conditions. Nearly all of the virgin timber, except a small amount being preserved in the National forest and in the State park area, has been harvested, but there still remains a large amount of forestation to be done. The Marquette National Forest has more than 500,000 acres in Chippewa and Mackinac Counties. The forest ranger, located at Rexford in charge of Marquette National Forest, stated that the National Forest Service each year made available more than \$50,000 of stumpage value for lumber and an equal amount for pulpwood. This means about 5 times this amount in actual returns paid for pulp and timber work, since the timber and pulp is sold by contract on stumpage evaluation and actual cutting and processing for market would involve 5 times the stumpage value.

The State of Michigan has large holdings in Luce County and would furnish an equal amount of timber and pulpwood work to that of the National forest. The Cadillac Lumber Company still has large

holdings in the area and furnishes a considerable amount of work. Several other large forest holdings by corporations exist as well as all of the small privately owned tracts.

2. Limestone Deposit and Dolomite Quarry

Existing in the cooperative area are large undeveloped deposits of limestone. A small quarry is presently operating--crushing limestone for the Production and Marketing Administration for distribution to farms in the area.

On Drummond Island, however, there is a large quarry of dolomite, limestone rocks and lime from which substantial shipments are made.

3. Recreation and Tourists

This area is noted for its recreational facilities. Tourists come into the area frequently during the summer season. The area provides ample facilities for fishing, hunting, boating, bathing, hiking and some winter sports. The extensive Great Lakes shoreline and the inland lakes and streams offer many beautiful spots for picnicking and camping. Brevoort Lake and Manistique Lake offer wonderful sites for summer homes, cabins and cottages and excellent facilities for bathing, boating and fishing. A fine sandy beach where bathhouse and picnic facilities are offered for public use is located at Lake Michigan Picnic Ground, 19 miles northwest of St. Ignace. Various camp grounds exist in all parts of the 3-county area. The Tahquamenon Falls is located in the cooperative area and this is one of the outstanding scenic points of interest in the Upper Peninsula. The Locks, located at Sault Ste. Marie, Michigan bring in tourists by the thousands each year. One of the main connecting points between the United States and Canada is the ferry across St. Marys River from Soo, Michigan into the Soo, Ontario, Canada. Definite plans are under way to build a bridge across the Straits of Mackinac. This project has been investigated and found to be feasible. Building of this will bring hundreds of thousands more tourists into the area, as one of the drawbacks to touring in the area has been the long delays caused by the need to cross the Straits by ferry.

C. Climate

The climate is characterized by rigorous winters and short mild summers. The mean temperature is 40°F. The annual mean precipitation is 30 inches, fairly well distributed throughout the year with heavier fall in the summer and autumn. Average snowfall is 70 inches; the area has a high relative humidity and a low percentage of possible sunshine. The wind moves infrequently and there is little evaporation. Winters are long and frequently extremely rigorous. The mean average temperature is below freezing from November to March with a low of minus 37°F on record. The frost-free period varies considerably with an average of only 100 days at Newberry in Luce County and 136 days at Sault Ste. Marie in Chippewa County.

